

16

NGC-145 / 000312-040

**Remarks**

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 6-9 are amended to correct typographical errors in the claim dependencies. Claims 1-3, 6-15, and 17-22 are pending.

**Claim Rejections - 35 U.S.C. §§ 102 and 103**

Claim 21 was rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Sites et al. (U.S. Patent No. 5,515,159; "Sites"). Claims 1-3, 6-9, 11, 14, 15, 17-19, 21 and 22 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sites in view of Palombo et al. (U.S. Patent No. 5,805,279; "Palombo"). Claims 10 and 20 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sites in view of Palombo and Mullins et al. (U.S. Patent No. 6,301,380; "Mullins"). Claim 12 was rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Sites in view of Palombo, Mullins, and Bonewitz et al. (U.S. Patent No. 5,926,268; "Bonewitz"). Claim 13 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sites in view of Palombo and further in view of Fox et al. (U.S. Patent No. 4,747,299; "Fox"). These rejections are respectfully, but most strenuously, traversed.

**CLAIMS 1 AND 15 AND CORRESPONDING DEPENDENT CLAIMS**

Applicants respectfully submit that the Office Action's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices, as recited in applicants' independent claim 1.

For explanatory purposes, applicants discuss herein one or more differences between the claimed invention and the Office Action's citations to Sites, Palombo, and Fox. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to Sites, Palombo, or Fox correspond to the claimed invention.

Sites (column 5, lines 39-56) discloses:

...The embodiment of FIG. 7 is substantially the same as the first embodiment shown in FIG. 1, but now additionally includes diffuse backlighting of the seal 12 as well as low incident angle side lighting. The backlighting is provided by an assembly 122 including a light transmissive diffuser member 124 and a relatively low intensity light source 126 having an intensity of between 5 and 25 ft. candles together with a reflector 128 which is located beneath the conveyor 42. Again the specific intensity is application dependent and thus may be varied depending on the specific application. The conveyor 42 now includes transparent or light transmissive sections 43 the size of the package 14' for the passage of light upwardly therethrough. In operation, the low incident angle side lighting is utilized, as before, to define the actual area of the seal 12; however, the backlighting is now used to locate and classify defects 15 and 17, for example, as shown in FIG. 5, within the seal boundaries.

Sites discloses a transparent conveyor that allows backlighting from light assembly 122 to reach the cameras 36. Sites teaches away from reflecting light from a carrier, for example, the conveyor, to the cameras 36 because the diffuse backlighting would mix with and contaminate the light signature from the reflection off the carrier. In addition, Sites discloses that the conveyor is transparent or light transmissive, but fails to disclose that the conveyor is a reflective surface. Sites fails to disclose the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices.

The Office Action (page 4, last paragraph) states:

Sites does not explicitly disclose how the light passes through the transparent packaging materials and the imager creates

the image according to the radiation wavelengths reflecting off the partially transparent packaging material and the carrier or the container beneath the partially transparent packaging material. It follows however that certain wavelengths pass through the partially transparent container lid while other wavelengths are reflected from the transparent lid and a certain subset of wavelengths that pass through the partially transparent lid are reflected from the container beneath the lid...

Assuming, *arguendo*, that this statement is correct, the statement nevertheless fails to teach or suggest the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices. Sites discloses that the conveyor is transparent or light transmissive, but fails to disclose that the conveyor or any other component reflects light from the light source to the cameras.

Accordingly, the Office Action's citation to Sites fails to satisfy at least one of the limitations recited in applicants' independent claim 1.

Palombo (Abstract) discloses:

A can end to be inspected, including a portion coated by a sealing material, is illuminated by polarized light. The light reflected from the object and sealing material is viewed by a camera through a polarizing filter. The polarizing filter blocks out polarized light reflected by the can end and sealing material that does not contain any defects, but passes light reflected by the sealing material that has been depolarized by a defect in the sealing material.

Palombo (column 2, lines 32-37) further discloses:

In preferred embodiments, the camera is positioned so that the entire can end is within the field of view of the camera. The polarizing filter is positioned relative to the camera so that only light reflected from the covered portion being inspected is received by the camera through the polarizing filter.

Palombo discloses reflection of light from the can, and preferably only light from a covered portion. Since the sealing material is bonded to the can, i.e., an aluminum or metal alloy

can which cannot transmit light, Palombo fails to disclose that the light is reflected off a carrier. Applicants note that the can is not comparable to a carrier because the can is an actual component of the packaging material. In addition, FIGS. 1 and 2 of Palombo all show the can as a lowest point of the imaging system with no reflective surface or carrier beneath the can. Palombo fails to disclose the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices.

Accordingly, the Office Action's citation to Palombo fails to satisfy at least one of the limitations recited in applicants' independent claim 1.

Fox ("Operation", column 4, lines 31-39) discloses:

If the container is properly sealed, the plunger will remain in its distended position if the vacuum in chamber 39 is held for a period of time. On the other hand, if either the lid or the seal has a leak, air will flow into the ullage space, and the distended container portion bottom will move further downwardly. This is sensed by the movement of the plunger, and is used to indicate whether the package is sealed or not.

Fox discloses using the movement of the plunger to determine if the seal has a leak. Fox fails to disclose the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices.

In addition, the Office Action (page 21, lines 17-19) states:

In mechanically deforming package seals of this nature it becomes more evident that the seal lacks integrity.

Applicants respectfully note that the mechanical deformation of Fox is measured with a mechanical movement (i.e., the plunger), not an imaging device, and it would not have been

obvious to change the principle of operation of Fox to employ an imaging device for detection of the mechanical movement.

Accordingly, the Office Action's citation to Fox fails to satisfy at least one of the limitations recited in applicants' independent claim 1.

The Office Action's citations to Sites, Palombo, and Fox all fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office Action's citations to Sites, Palombo, or Fox of the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices, as recited in applicants' independent claim 1.

For all the reasons presented above with reference to claim 1, claims 1 and 15 are believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 1 and 15, as well as for their own additional characterizations.

#### CLAIMS 10, 20, AND 22 AND CORRESPONDING DEPENDENT CLAIMS

Applicants respectfully submit that the Office Action's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest the computer component that employs the one or more optical components to filter out the one or more absorption spectrums from the one or more of the one or more radiation wavelengths, as recited in applicants' independent claim 10.

For explanatory purposes, applicants discuss herein one or more differences between the claimed invention and the Office Action's citations to Sites, Palombo, and Mullins. This

discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to Sites, Palombo, or Mullins correspond to the claimed invention.

**Sites (Abstract) discloses:**

On-line inspection of opaque, translucent and transparent elastomer sealed flexible and semi-rigid package seals is provided. In the case of highly reflective opaque seals of various elastomers and colors, low incident angle structured side lighting is used to locate and define the seal and highlight defects within the sealed area. For transparent i.e. highly light transmissive seals, not only is the low incident structured side lighting utilized to define the seal area, but back lighting of the package and seal is provided in order to then locate and classify defects within the seal boundaries. Multiple video images of portions of the area containing the seal and portions of the remaining lidstock are generated by CCD type cameras in response to one or more sensors which detect the presence and proper positioning of the package moving along a conveyor for image acquisition. The images generated are fed to one or more image processors which perform a series of stored program operations which determines if the package is accepted, possibly accepted, or rejected based upon the quality of the seal area and the presence of any defects in the seal boundaries.

Sites discloses the video images for identifying seal defects. Sites fails to disclose the computer component that employs the one or more optical components to filter out the one or more absorption spectrums from the one or more of the one or more radiation wavelengths. Sites also fails to disclose the computer component that employs the one or more of the one or more imaging devices to determine the one or more absorption spectrums of the one or more graphics. This point has been conceded by the Office Action (page 16, lines 10-11; page 16, lines 21-22).

Accordingly, the Office Action's citation to Sites fails to satisfy at least one of the limitations recited in applicants' independent claim 10.

**Palombo (Abstract) discloses:**

A can end to be inspected, including a portion coated by a sealing material, is illuminated by polarized light. The light

reflected from the object and sealing material is viewed by a camera through a polarizing filter. The polarizing filter blocks out polarized light reflected by the can end and sealing material that does not contain any defects, but passes light reflected by the sealing material that has been depolarized by a defect in the sealing material.

Palombo discloses use of a polarizing filter to block out polarized light. Palombo fails to disclose the computer component that employs the one or more optical components to filter out the one or more absorption spectrums from the one or more of the one or more radiation wavelengths. Palombo also fails to disclose the computer component that employs the one or more of the one or more imaging devices to determine the one or more absorption spectrums of the one or more graphics. This point has been conceded by the Office Action (page 16, lines 10-11; page 16, lines 21-22).

The Office Action (page 16, line 22 to page 17, line 2) states:

However, Palombo discloses filtering a certain spectrum of light so as not to admit certain light to the imager in order to better inspect the transparent packaging material.

Palombo discloses only the polarizing filter, which removes all wavelengths of light based on their polarization with respect to the polarizing filter, i.e., at 90 degrees relative to the filter, as is known in the art. The polarizing filter does not filter out a specific spectrum of light or range of wavelengths and thus cannot be considered a bandpass filter. For example, see Bonewitz, column 6, lines 20-31.

Accordingly, the Office Action's citation to Palombo fails to satisfy at least one of the limitations recited in applicants' independent claim 10.

Mullins (column 3, lines 22-32) discloses:

The inspection system may also take advantage of the blocking characteristics of a poly wrap film which has printing upon it. The image printed upon the film will act to block light transmission in a particular pattern, or reduce it. The system can

rapidly "learn" this light scattering by allowing it to store acceptable images in its database. Then, occluded light patterns are learned as acceptable. Other wrap patterns likewise may be learned in a manner similar to the system's initial programming with conventional packaging fold and surface images.

Mullins discloses taking advantage of the blocking characteristics of the image (e.g., printing) and learning a particular pattern. Mullins teaches away from filtering the absorption spectrum of the image because doing so would substantially reduce or eliminate the blocking characteristics of the image, which Mullins relies on to accept packages. Referring to applicants' FIG. 6 and page 13, line 18 to page 14, line 6, the images of the seal do not comprise the graphics and/or the text. Mullins fails to disclose the computer component that employs the one or more optical components to filter out the one or more absorption spectrums from the one or more of the one or more radiation wavelengths. Mullins also fails to disclose the computer component that employs the one or more of the one or more imaging devices to determine the one or more absorption spectrums of the one or more graphics.

Accordingly, the Office Action's citation to Mullins fails to satisfy at least one of the limitations recited in applicants' independent claim 10.

The Office Action's citations to Sites, Palombo, and Mullins all fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office Action's citations to Sites, Palombo, or Mullins of the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices, as recited in applicants' independent claim 10.

For all the reasons presented above with reference to claim 10, claims 10, 20, and 22 are believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 10, 20, and 22, as well as for their own additional characterizations.



## CLAIMS 12 AND 21 AND CORRESPONDING DEPENDENT CLAIMS

Applicants respectfully submit that the Office Action's citations to the applied references, with or without modification or combination, assuming, *arguendo*, that the modification or combination of the Office Action's citations to the applied references is proper, do not teach or suggest the one or more compounds within the one or more of the one or more packaging materials that react to the one or more of the one or more radiation wavelengths of the one or more fluorescing excitation sources, wherein the one or more compounds emit one or more fluorescing wavelengths, as recited in applicants' independent claim 12.

For explanatory purposes, applicants discuss herein one or more differences between the claimed invention and the Office Action's citations to Sites, Palombo, Mullins, and Bonewitz. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the Office Action's citations to Sites, Palombo, Mullins, or Bonewitz correspond to the claimed invention.

## Sites (Abstract) discloses:

On-line inspection of opaque, translucent and transparent elastomer sealed flexible and semi-rigid package seals is provided. In the case of highly reflective opaque seals of various elastomers and colors, low incident angle structured side lighting is used to locate and define the seal and highlight defects within the sealed area. For transparent i.e. highly light transmissive seals, not only is the low incident structured side lighting utilized to define the seal area, but back lighting of the package and seal is provided in order to then locate and classify defects within the seal boundaries. Multiple video images of portions of the area containing the seal and portions of the remaining lidstock are generated by CCD type cameras in response to one or more sensors which detect the presence and proper positioning of the package moving along a conveyor for image acquisition. The images generated are fed to one or more image processors which perform a series of stored program operations which determines if the package is accepted,

possibly accepted, or rejected based upon the quality of the seal area and the presence of any defects in the seal boundaries.

Sites discloses the video images for identifying seal defects. Sites fails to disclose the one or more compounds within the one or more of the one or more packaging materials that react to the one or more of the one or more radiation wavelengths of the one or more fluorescing excitation sources, wherein the one or more compounds emit one or more fluorescing wavelengths. This point has been conceded by the Office Action (page 19, line 20 to page 20, line 2)

Accordingly, the Office Action's citation to Sites fails to satisfy at least one of the limitations recited in applicants' independent claim 12.

Palombo (column 1, lines 63-65) discloses:

The apparatus comprises a light source for illuminating the can end, means for polarizing the light from the light source, imaging means for receiving light reflected from the can end, and a polarizing filter.

Palombo discloses use of the light source. Palombo fails to disclose a fluorescing excitation source and fails to disclose the one or more compounds within the one or more of the one or more packaging materials that react to the one or more of the one or more radiation wavelengths of the one or more fluorescing excitation sources, wherein the one or more compounds emit one or more fluorescing wavelengths. This point has been conceded by the Office Action (page 19, line 20 to page 20, line 2)

Accordingly, the Office Action's citation to Palombo fails to satisfy at least one of the limitations recited in applicants' independent claim 12.

Mullins (column 2, lines 41-54) discloses:

Applicants novel system takes advantage of a unique property of clear or partially clear poly film. The film acts, for brief distances, as a light conductor. In many ways this is similar to fiber optic

light transmission, when an endpoint is reached with a medium which has a different index of refraction, light appears to emanate from the endpoint, causing it to "glow."

Thus, as may be seen in FIG. 4, light source 40 sends incident light into the wrap itself. The light "escapes" from the poly film wrap at edges and folds where it reaches a reflective boundary. The escaped light 42 is captured via lens 44 to camera 46 and is thence sent to an image processor (not shown).

Mullins discloses the thin poly film acting as a light conductor, similar to a fiber optic cable. The scientific principle responsible for this reaction is known as total internal reflection. This is not the same principle as fluorescence, where light of a first wavelength (e.g., a fluorescing excitation wavelength) is absorbed by an object, which then emits light of a second wavelength (e.g., the fluorescing wavelength). Mullins fails to disclose the one or more compounds within the one or more of the one or more packaging materials that react to the one or more of the one or more radiation wavelengths of the one or more fluorescing excitation sources, wherein the one or more compounds emit one or more fluorescing wavelengths.

Accordingly, the Office Action's citation to Mullins fails to satisfy at least one of the limitations recited in applicants' independent claim 12.

Bonewitz (column 1, lines 49-65) discloses:

Briefly described, a system embodying aspects of the invention is for inspecting a container for stress defects. The system includes a light source for illuminating the container and a camera for generating an image of the illuminated container. A first polarizer positioned between the light source and the container polarizes the light illuminating the container and a second polarizer positioned between the container and the camera polarizes the light transmitted through the container before the camera generates the image. As positioned, the axes of transmission of the first and second polarizers are non-parallel relative to each other. The image generated by the camera has a plurality of pixels each with a value representative of an optical characteristic of the image. The system further includes an image processor for processing the image generated by the camera as a function of the pixel values to detect edges in the image which correspond to defects in the container.

Bonewitz discloses the first polarizer and the second polarizer. As discussed above, a polarizer is not bandpass filter. In fact, Bonewitz discloses that the two polarizers effectively block all light if no defects are present, resulting in a black image (column 6, lines 20-31). Bonewitz fails to disclose the one or more compounds within the one or more of the one or more packaging materials that react to the one or more of the one or more radiation wavelengths of the one or more fluorescing excitation sources, wherein the one or more compounds emit one or more fluorescing wavelengths.

Accordingly, the Office Action's citation to Bonewitz fails to satisfy at least one of the limitations recited in applicants' independent claim 12.

The Office Action's citations to Sites, Palombo, Mullins, and Bonewitz all fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office Action's citations to Sites, Palombo, Mullins, or Bonewitz of the one or more of the one or more radiation wavelengths that reflect off the carrier of the one or more of the one or more packaging materials to the one or more imaging devices, as recited in applicants' independent claim 12.

For all the reasons presented above with reference to claim 1, claims 12 and 21 are believed neither anticipated nor obvious over the art of record. The corresponding dependent claims are believed allowable for the same reasons as independent claims 12 and 21, as well as for their own additional characterizations.

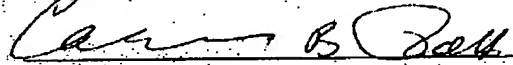
Withdrawal of the §§ 102 and 103 rejections is therefore respectfully requested.

28

NGC-145 / 000312-040

In view of the above amendments and remarks, allowance of all claims pending is respectfully requested. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicants' attorney.

Respectfully submitted,



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